GCCS System Integration Support

Joint Engineer Planning and Execution System (JEPES) Users Manual

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ABSTRACT

This User Manual (UM) describes the Joint Engineer Planning and Execution System (JEPES). It presents the capabilities, features, and functions of JEPES. JEPES is part of the Global Command and Control System (GCCS) and is used in assisting the planner in developing the Civil Engineering Support Plan (CESP) annex to an Operation Plan (OPLAN). It starts with the civil engineering data imported from the Joint Operation Planning and Execution System (JOPES) Core database. JEPES will identify facilities required to support deploying forces, apply existing assets to fulfill these requirements, and then assign engineering resources to construct remaining unsatisfied requirements. Information concerning JEPES inputs and outputs, user terminal processes, error messages, JEPES data dictionary, and installation instructions are included in this UM. The JEPES Terminal Users Guide (TUG), September 30, 1993, should be used in conjunction with this manual.

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1.0 GENERAL

1.1 Purpose of the Users Manual

The objective of the Joint Engineer Planning and Execution System (JEPES) Users Manual (UM) is to provide the information necessary for non-Automated Data Processing (ADP) personnel to effectively use JEPES. Section 2 provides an overview of JEPES, including a brief synopsis of JEPES inputs, outputs, and processing. Section 3 stresses the JEPES database, focusing on the inputs and outputs. Section 4 provides a list of JEPES database tables and predefined JEPES commands. Section 5 is an enhancement; i.e., written for use in conjunction with the existing JEPES Terminal Users Guide (TUG), reference b. The appendices provide information relating to various sections, e.g., terms, abbreviations, error messages, data dictionary, JEPES codes, functions not yet implemented, specific user operations, and installation instructions.

1.2 Project References

The following documents are referenced in or are applicable to this UM:

a. Defense Information Systems Agency, Scheduling and Movement (S&M), Global Command and Control System (GCCS) Core Database Maintenance Manual, Washington, D.C., August 25, 1994.

b. Defense Systems Support Organization, Joint Engineer Planning and Execution System (JEPES) Terminal Users Guide (TUG), Washington, D.C., September 30, 1993.

c. Joint Data Systems Support Center, Joint Engineer Planning and Execution System (JEPES) Software Development Plan, Washington, D.C., February 28, 1991.

d. Joint Data Systems Support Center, Joint Engineer Planning and Execution System (JEPES) System Specification, Washington, D.C., May 17, 1990.

e. Joint Data Systems Support Center, Joint Operation Planning System (JOPS), Civil Engineering Support Plan Generator (CESPG) Computer System Manual (CSM), UM 122-86, Washington, D.C., April 1, 1986.

References c and d, formed the basis for JEPES development. Although JEPES development replaced some of the Civil Engineering Support Plan Generator (CESPG) functionality, reference e is required for Real-Property Inventory (RPI) asset extraction, which will be incorporated into the Global Command and Control System (GCCS) in a later release.

1.3 Terms and Abbreviations

See Appendix A for abbreviations and Appendix B for terms.

1.4 Security

The JEPES programs are unclassified. GCCS data are classified up to SECRET. Therefore, JEPES can be classified up to SECRET. Classification is determined by the highest classification of any information that JEPES will process.

Because JEPES processes classified data, the selected computer must be approved to operate in a classified mode commensurate with the classification of data. To enhance information security, it is recommended that all JEPES data are installed on removable diskettes/tapes and that the diskettes/tapes be stored in an approved security container when not in use. All storage media and reports must be marked with the appropriate classification.

2.0 SYSTEM SUMMARY

This UM discusses the operation of JEPES, a subsystem within GCCS, the follow-on system to the Worldwide Military Command and Control System (WWMCCS). JEPES begins a new Operation Plan (OPLAN) with Type Unit Characteristics File (TUCHA) and Time-Phased Force and Deployment Data (TPFDD) data from the Joint Operation Planning and Execution System (JOPES) Core database, and RPI asset data from the Services. Figure 2.0-1 indicates the JEPES operation in this division. For information pertaining to the RPI portion, please refer to the CESPG UM, reference e.

2.1 System Overview

JEPES is a menu-driven system that assists in evaluating and preparing the Civil Engineering Support Plan (CESP) annex to OPLANs. JEPES provides functions to add, delete, modify, and analyze the JEPES database. JEPES also provides functions to import and export the JEPES database. JEPES generates facilities requirements needed to support deploying forces. JEPES then determines if adequate facilities exist to support the deployed forces, and if not, JEPES determines if adequate engineering resources are available to construct any required facilities. JEPES can produce a series of reports and graphics to show generated requirements, existing assets, and existing engineering resources. JEPES also provides data for Logistics Sustainability Analysis (LSA) and Logistics Sustainment Analysis and Feasibility Estimator (LOGSAFE) systems.

JEPES is an automated tool for use by the Joint Staff (JS), the Commanders-in-Chief (CINCs) of the unified and specified commands, and the Service Civil Engineering planners.

2.2 System Operation

Initially, the TPFDD and TUCHA data are imported into JEPES. For a future release, the RPI asset data will also be imported into JEPES. Data are analyzed and edited as required. Once integrity of the database has been assured, civil engineering requirements and the capability to satisfy these requirements are determined. Appropriate reports, queries, and graphics can then be produced. In addition, support files for LOGSAFE and LSA may be produced.

2.3 System Configuration

JEPES, as currently configured, operates in a client-server environment. The server is a SPARC1000 and the client a SPARC20 or higher. The operating system is Solaris 2.3. The ORACLE Relational Database Management System (RDBMS) resides on the server and the JEPES application on the client. SQL*Net is used to communicate between the ORACLE database and the JEPES application. JEPES uses ORACLE Forms 4.0 for the graphical user interface (GUI) interface, Applixware for graphics output, and Ada software for the model algorithms compiled using the Alsys Ada compiler. The combination of commercial off-the-shelf (COTS) and custom software provides a system that is easy to

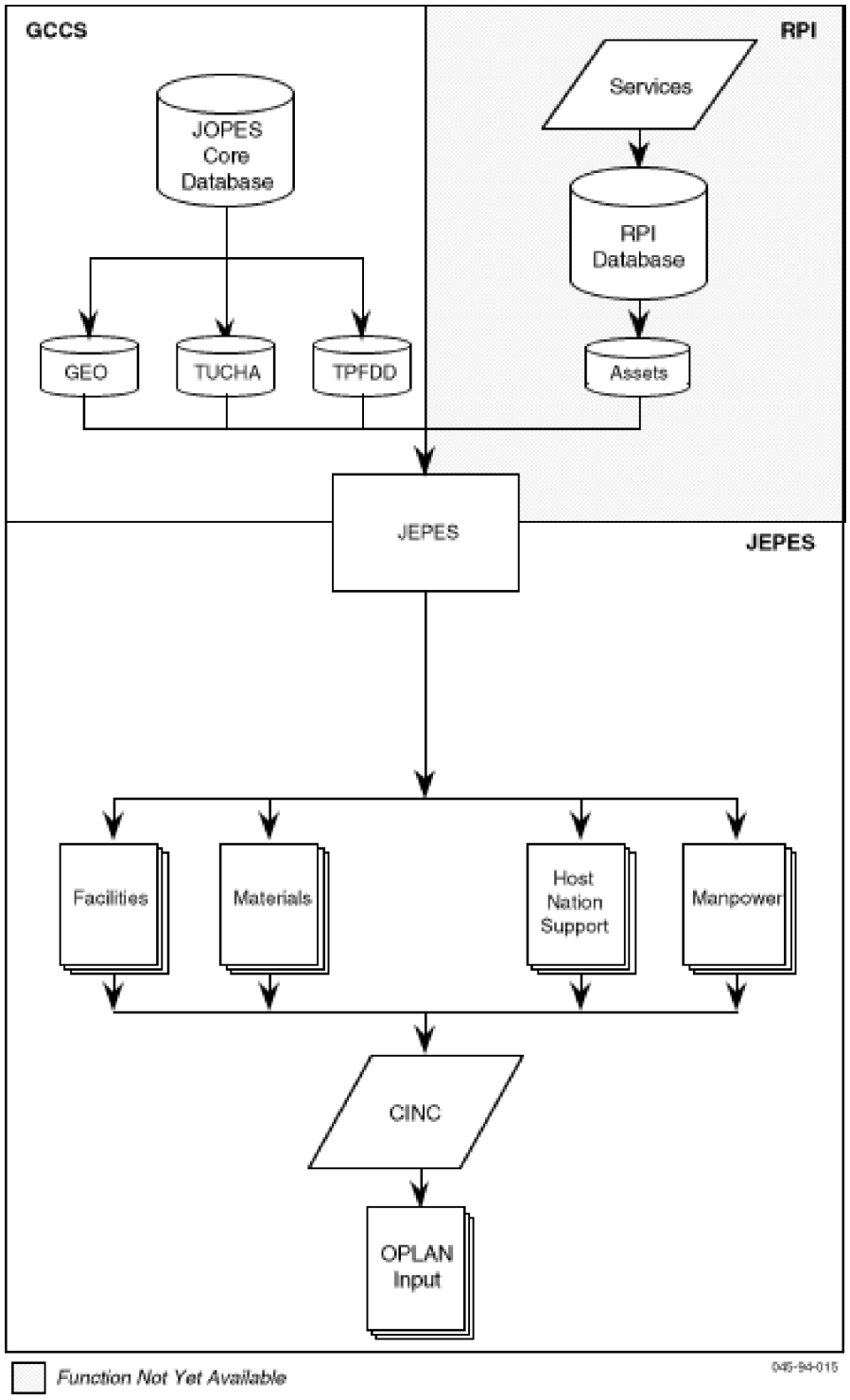

Figure 2.0-1. JEPES Operation

use and requires very little knowledge of data processing. The user will connect to GCCS from a Sun Workstation or with a personal computer (PC) using X-Server software. See Figure 2.3-1 for an overview of JEPES system architecture.

2.4 System Organization

Figure 2.4-1 shows the JEPES system organization, which performs the functions described below.

2.4.1 Utilities

The Utilities function allows the user to export and import plan-dependent tables, plan-independent tables, and the entire JEPES database. The user can import ORACLE Version 6.0 export files created using the JEPES PC Version 3.0. TPFDD and TUCHA data can be imported from the JOPES Core database into the JEPES database.

2.4.2 Database Maintenance

The Database Maintenance function consists of three activities. The Edit tables activity provides the user with the capability to query, delete, edit, and add data within JEPES database tables. The Database Analysis function checks for data consistency across tables. Reports are generated if discrepancies are detected. The Update JEPES tables function updates certain JEPES tables for database consistency.

2.4.3 Requirements Generation

There are eight models in the Requirements Generation function to generate a set of engineering requirements for satisfaction of a specific OPLAN. Four models have been implemented. Requirements can be generated for unit allocated, planner facility, population, and base requirements. Reports can be produced for all projects or for those limited to a specific base. Graphs and spreadsheets can be generated to display population and various time-phased requirements.

2.4.4 Requirements Analysis

The Requirements Analysis function is divided into two parts. The first part is the Apply Assets function. This function satisfies the facility requirements generated by the Requirements Generation using existing facilities. The process takes into consideration the availability of U.S., host nation, and/or leased assets. Printed reports can be generated to display all asset-satisfied and asset-unsatisfied requirements.

The second part, Apply Engineering Resources, assigns engineering resources to requirements that were not satisfied by the Apply Assets function. These resources can include host nation and contractor engineering resources, as well as U.S. resources. Printed reports listing construction requirements and any remaining unsatisfied requirements can be produced.

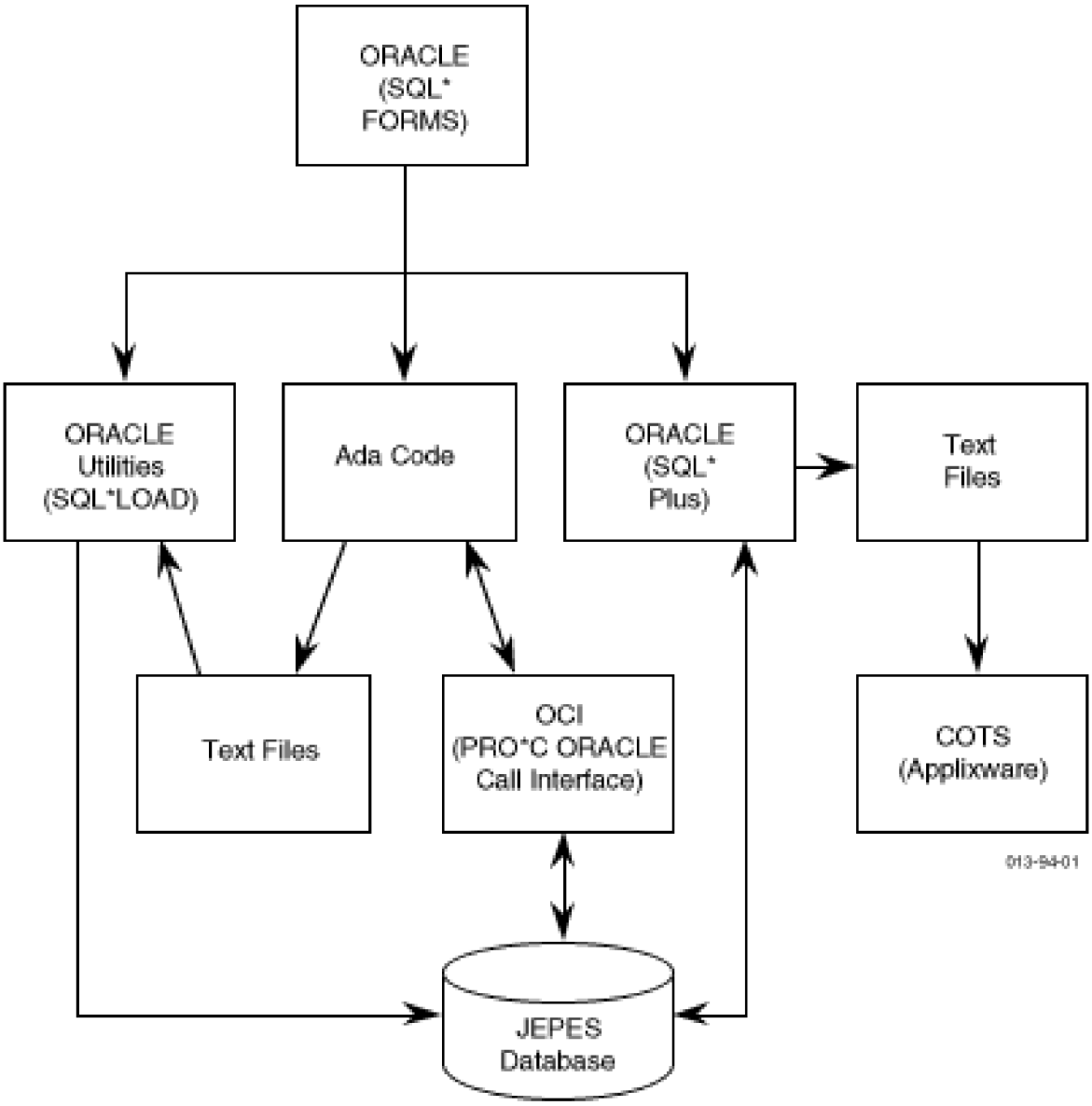

Figure 2.3-1. JEPES System Architecture

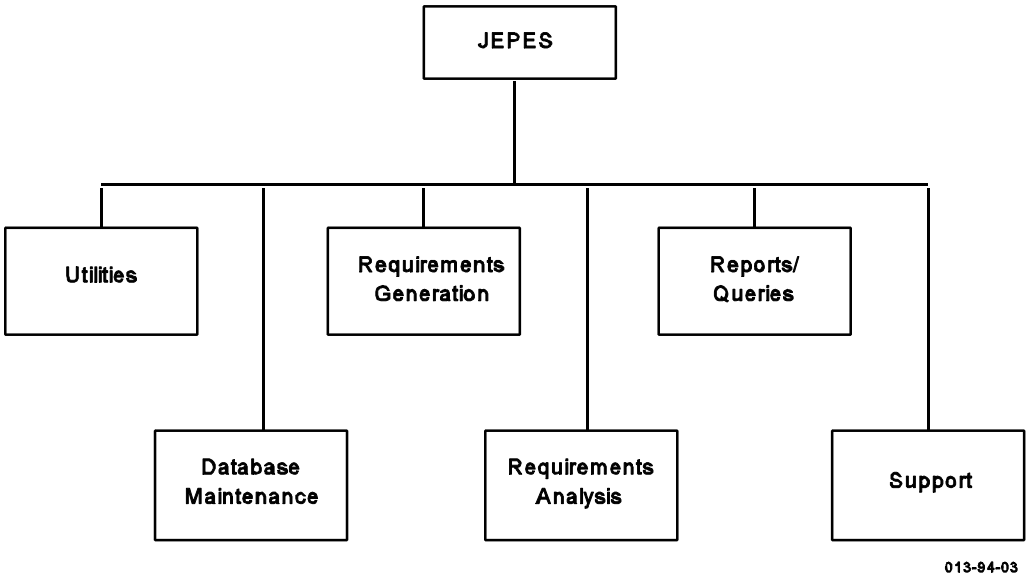

Figure 2.4-1. JEPES System Organization

2.4.5 Reports/Queries

The Standard Reports function allows the user to generate printed reports, spreadsheets, and graphs concerning Requirements Generation and Requirements Analysis reports. The Users Reports function allows the user to generate a previously defined user report. The *Ad Hoc* Queries function allows a user to construct an *ad hoc* query or call a predefined *ad hoc* query.

2.4.6 Support

The Support function provides the engineering planners with the ability to analyze the JEPES outputs in terms of OPLAN sustainability and to evaluate alternative courses of action. This information can be sent to the LSA system. The Support function also provides non-unit cargo information to be sent to the LOGSAFE system. Tutorial and System Administration functions are not yet available.

2.5 System Performance

Performance is dependent on the size of the force list and database used within JEPES, the client hardware, and utilization. For a SPARC10 with 48 megabytes (MB) of memory, sole utilization of the machine and using a force list of approximately 200 entries, all JEPES functions fully execute in less than 10 minutes.

2.6 Contingencies and Alternate Modes of Operation

There are no provisions within JEPES for contingencies or alternative modes of operation. Users should adhere to the normal good practices of making backups of the database at regular intervals or whenever a large number of transactions have occurred.

2.7 Database

JEPES uses the ORACLE RDBMS for database operation and Applixware data spreadsheets for graphs. The section below describes some limitations and requirements of JEPES data storage and maintenance.

2.7.1 Database Storage

JEPES GCCS Version 4.0 uses ORACLE 7.0 software running on a SPARC1000 and stores data in ORACLE tables. All JEPES tables are stored in the JEPES_DATA tablespace. JEPES_DATA is a 300 MB tablespace that allows up to five JEPES users, with each user needing approximately 60 MB. The database resides on the server and the JEPES application on the client. SQL*Net is used to communicate between the two platforms. ORACLE is a COTS RDBMS tool used to organize, store, maintain, calculate, combine, and retrieve information.

In addition to ORACLE, Applixware graphical software is used to produce graphs and create data files.

2.7.2 JEPES Requirements

The JEPES application requires 28 MB of disk storage. Each user requires 30 MB, which includes three OPLANs stored in export files. JEPES_USER_DIR must contain the following subdirectories:

1. *oplans*, which contains users' OPLAN export files,
   a.
   user_sql, which contains users' Structured Query Language (SQL) query files,
   b.
   user_rpt, which contains subdirectories that store users' SQL report files, and
   c.
   data, which contains users' text files.

Note: Subdirectories are case sensitive and must be in lower-case.

JEPES_USER_DIR is a UNIX environment variable that defines the directory path where JEPES users' subdirectories and files are located. Unless set by the user, in the *.cshrc* file, the default is *$HOME/jepes*. *$HOME* is the users' home directory.

2.8 General Description of Inputs, Processing, and Outputs

2.8.1 Inputs

The ORACLE tables acquire data from a keyboard, GCCS ORACLE tables, or a load utility program (ORACLE SQL*Loader), which loads data from American Standard Code for Information Interchange (ASCII) text files. Outputs of Ada programs are also input to JEPES tables. Input sources are discussed below.

2.8.1.1 General

JEPES' main input source is data downloaded from the JOPES Core database and from the Services (Army, Navy, and Air Force). GCCS data are extracted from ORACLE tables and inserted into JEPES ORACLE tables. RPI data are currently input via ASCII text files. See Section 3.2.2 for more information on the JOPES Core database and the Services' RPI files. JEPES also uses data acquired through keyboard entries (See Section 5.3.2, Database Maintenance, and Section 5.3.5, Requirements Analysis). Also, eight Ada program outputs provide text data files used as input to generate JEPES reports and graphics.

2.8.1.2 Input Source GCCS Table

The following GCCS tables are used as input into JEPES tables:

a.TUCHA:
1.Unit_Type table, and
2.Unit_Type_Cargo_4th table.

b.TPFDD:
1.Oplan_Force_Rqmt table, and
2.Oplan_Force_Rqmt_Loc table.

c.Others:
1.Geographic_Location table.

2.8.1.3 Input Source Data Files

The following RPI data files are obtained via diskette(s):

a.Civil engineering files (CEF):
1.*assetus* file, and
2.*assethn* file.

2.8.1.4 Input Keyboard Information

A user can add, delete, and update JEPES OPLAN independent and dependent database tables through the Database Maintenance function of JEPES. Refer to Section 5.3.2 for more information. Before running the Requirements Generation function, a user can define the requirement aggregation periods. Various parameters for analysis and report generation may also be entered, e.g., engineer force utilization, sources from which to draw assets, engineer phase-in efficiency, attrition, and skill substitution.

2.8.2 Processing

JEPES is a menu-driven program and is composed of six functions. Some functions execute an Ada program. Some functions provide needed information in terms of input/output to feed into another function. The Ada process within these functions will extract data from the database and perform calculations before transferring the workload into other batch or SQL files.

2.8.2.1 Utilities

This function provides the user the option to export and import plan-independent tables, plan-dependent tables, or the entire JEPES database. This enables the user to import a different OPLAN into JEPES; i.e., plan-dependent tables only, import updated plan-independent tables only or restore an entire JEPES database for a particular OPLAN. It is recommended that a user use the export function to backup the JEPES database. This function allows the user to import an export file created from the JEPES PC Version 3.0. This function imports TPFDD and TUCHA data from the JOPES Core database into the JEPES database for a particular OPLAN.

2.8.2.2 Database Maintenance

This function allows planners to manually edit, query, add, or delete data in the database. This function gives planners the capability to analyze data and determine any discrepancies for correction before generating requirements.

2.8.2.3 Requirements Generation

This function generates a general set of engineering requirements satisfaction, based on a specific OPLAN and engineering planner input. These requirements are subdivided into eight categories: unit allocated; planner facility; population; base requirements; medical; ammunition; operations; and maintenance petroleum, oil, and lubricants (POL). Only the first four categories (unit allocated, planner facility,

population, and base requirements) have been implemented. Unit-allocated requirements encompass the CESP unit-allocated and equipment requirements. Planner facility requirements encompass support derived from the civil engineering planner input requirements. Population requirements encompass the CESP people and total population (TOTPOP) requirements. Base requirements encompass CESP base-allocated requirements.

2.8.2.4 Requirements Analysis

This function applies available assets and engineering capability at a base complex to the engineering requirements generated. The Requirements Generation module must complete generation before executing the Requirements Analysis module. The Requirements Analysis module is divided into two functions: Apply Assets function and Apply Engineering Resources function.

The Apply Assets function matches the available facility assets with the generated facility requirements. The process can take into consideration the availability of one or more U.S., host nation, and facility asset substitution (or leased) assets. If user specified, the war damage to facility assets are assessed and war damage repair requirements are generated.

The Apply Engineering Resources function will calculate and assign available engineering capabilities to the remaining unsatisfied requirements. These capabilities can include host nation and contractor engineering resources as well as U.S. resources. If user specified, unsatisfied requirements will be assigned to the host nation and/or contractor first; then any remaining requirements will be assigned to the U.S.. War damage to completed construction and engineer skill substitution can also be considered. Other user inputs considered for determining engineering capabilities are engineer phase-in efficiency, climatic factors, engineer attrition, and whether engineers are used at the base complex level only or within an entire region.

2.8.2.5 Reports/Queries

This function will generate standard and user reports and invoke SQL*Plus. The Standard Reports function will generate the reports for Requirements Generation and Requirements Analysis functions. The Requirements Generation reports and graphs can be generated with the option of modifying the aggregation period (first day/last day). The Requirements Analysis function can generate reports for Apply Assets and Apply Engineering Resources with an option to define region and/or time constraints. The User Reports function will display a list of user-defined report files allowing the user to generate a particular report. The *Ad Hoc* Queries function will invoke SQL*Plus, enabling a knowledgeable user to construct *ad hoc* queries and call predefined *ad hoc* queries.

2.8.2.6 Support

This function generates non-unit cargo information for the LOGSAFE and generates LSA information. The Non-Unit Cargo function allows the user to generate Class IV non-unit cargo information needed to support the civil engineering activities in the Area of Operation (AOR) and then stores the generated requirements in a text file to be sent to LOGSAFE. The LSA function provides assistance to the planner in determining the supportability of a Course of Action (COA)/OPLAN based on the availability of six infrastructure subelements. The subelements are airfields, POL storage/distribution, seaports, non-POL storage/distribution, troop support, and utilities. Spreadsheets and graphics can be generated to display this information. LSA data can be stored in a text file to send to LSA. Requirements Generation and

Requirements Analysis must have completed operation before running the Non-Unit Cargo function and the LSA function.

2.8.3 Outputs

JEPES produces hardcopy reports and/or screen displays. Applixware is invoked to display or print graphics. These outputs are discussed below according to functionality.

2.8.3.1 TPFDD Extract Report

The TPFDD Extract function under the Utilities function produces a TPFDD reject file for a particular OPLAN.

2.8.3.2 Database Analysis

This function provides printed reports displaying discrepancies between database tables. See Section 5.3.2.2 for more information.

2.8.3.3 Requirements Generation

This function provides printed reports displaying the facility requirements for unit-allocated, planner facility, population, and base forces. A report can be generated for the total requirement or a selected base complex. This function also provides displayed/printed graphics showing base population data, time-phased population growth over an entire OPLAN, time-phased requirements data for up to four specific facility category codes for an OPLAN, and time-phased requirements data for up to four specific facility category codes at a specific base complex.

2.8.3.4 Requirements Analysis

This function provides printed reports displaying all asset-satisfied and asset-unsatisfied requirements. The same reports can be generated for a specified region and/or time constraint. This function also provides reports for all construction requirements, construction requirements for a specified region and/or time constraint, and construction requirements within the analysis period. If there are any remaining unsatisfied requirements after executing the Apply Engineering Resource function, then these requirements can be printed.

2.8.3.5 Reports/Queries

This function recreates the same reports and Applixware graphics as from the Requirements Generation function and the Requirements Analysis function.

2.8.3.6 Support

2.8.3.6.1 Non-Unit Cargo

This function provides reports of the Class IV material requirements needed to support the civil engineering activity in the area of operation. This information is also used to produce a LOGSAFE text file that can be passed to the LOGSAFE system.

2.8.3.6.2 Logistic Sustainability Analysis

This function displays LSA data graphs. LSA data can be generated for six subelements: airfields, seaports, POL storage/distribution, non-POL storage/distribution, troop support, and utilities. The user can display/print graphs producing the lowest percentage for each infrastructure subelement by time period, lowest level of sustainability for each infrastructure subelement, and percent available for each subelement. LSA data can be stored in a text file to pass to the LSA system.